ARCS

Remedial Planning Activities at Selected
Uncontrolled Hazardous Substance Disposal
Sites in the Zone of Regions IX and X

FINAL 100 PERCENT
CONSTRUCTION PLANS AND SPECIFICATIONS
NEWMARK OU REMEDIAL DESIGN
NEWMARK GROUNDWATER
CONTAMINATION SUPERFUND SITE
NORTH PLANT PIPELINE

U.S. Environmental Protection Agency
Contract No. 68-W9-0054

URS Greiner

Team Subcontractors:

Black & Veatch Special Projects Corp.
Shannon and Wilson, Inc.

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Contract No. 68-W9-0054 / WA No. 54-37-9NJ5
U.S. Environmental Protection Agency
Region IX
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SECTION 1
GENERAL REQUIREMENTS

1. GENERAL:

1.1 Definitions - The words "Water Department" shall mean the City of San Bernardino Municipal Water Department.

The word "Board" or words "Board of Water Commissioners (BOWC)" shall mean the Board of Water Commissioners of the City of San Bernardino Municipal Water Department.

The phrases "directed, required, permitted, ordered, designated, or prescribed by the Water Department" or other phrases of similar meaning, used in the specifications or upon the drawings, shall be understood to mean that the direction, requirement, permission, order, designation, or prescription of the Engineer is required, and similarly, the phrases "approved by, acceptable to, and satisfactory to the Water Department," or words of similar meaning, shall mean approved by or acceptable to, or satisfactory to the Engineer, unless otherwise expressly stated.

The word "Engineer" shall mean a Civil Engineer registered as such in the State of California and employed by the Water Department, acting either directly or through designated and properly authorized agents, assistants, and/or inspectors.

The word "Contractor" shall mean the person, persons, partnership or corporation duly licensed as such in the State of California to enter into a contract for the performance of the designated work.

The word "Applicant" used herein shall mean the person, persons, or duly authorized representatives of the party or parties requesting an extension or addition to the Water Department's water system.

The word "plates" or "standard drawings" shall mean collectively all of the standard drawings accompanying these specifications and made a part hereof.

The phrases "or equal", and "or approved equal (OAE)" shall be used to refer to those construction materials which, contingent upon the review and approval of the Water Department's Engineer, may be used in lieu of specifically designated materials, provided that the replacement materials meet or exceed the specifications of the originally designated materials.

The word "plans" shall refer to the Water System Construction Plans that have been prepared by the Applicant's engineer and approved by the Water Department.

The phrase "at the Contractors expense" shall mean the Contractor shall pay the Department the billed labor, equipment, and material charges plus 10 percent.

1.2 Conditions - The decision of the Water Department shall be final on all issues relating to the acceptability and classification of material, machinery or plant equipment, the proper execution, progress or sequence of the work, quantities, and the interpretation of specifications and/or drawings.

The Contractor shall obtain copies of and comply with all applicable current statutes, laws, ordinances, rules, regulations, and specifications of the United States Government, the State of California, the County of San Bernardino, City of San Bernardino, and any other governmental agencies having jurisdiction, and shall make application for all required permits and bear the cost of same.

All permits for the construction shall be obtained by the Contractor from the appropriate agencies prior to starting construction.

In the event of conflict between the requirements of these specifications and the requirements of the permits, it shall be understood that the more exacting requirements shall govern.

The Contractor shall furnish to the Water Department copies of all required permits and licenses prior to the start of construction. Upon completion of construction, the Contractor shall provide the Water Department with documentation attesting to the satisfactory closure of said permits and licenses.

1.3 Acceptability of Methods and Materials - The Water Department's Engineer shall make the final determination regarding the acceptability of materials to be used and the methods to be employed on all water projects.

1.4 Cal-Osha Safety Code - All work shall be performed in compliance with the California Code of Regulations, Title 8, Industrial Relations (CAL/OSHA), Construction Safety Orders (CS0) and General Industry Safety Orders (GIS0).

1.5 Public Convenience Requirements:

A. The Contractor shall conduct his operations so as to offer the least possible obstruction and inconvenience to the public and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public.

B. Unless otherwise provided, all public traffic shall be permitted to pass through the work area with as little inconvenience and delay as possible. Where possible, such traffic shall be routed on new or existing paved surfaces.

C. Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at no expense to the Department.

D. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

E. Convenient access to driveways, houses, and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition. When the abutting property owner's access across the right-of-way line is to be eliminated or to be replaced by another access, the property owner's access shall not be closed until the replacement access facilities are usable.

F. Water or dust palliative shall be applied as required for the alleviation or prevention of dust nuisance.

G. In order to expedite the passage of public traffic through or around the work, the Contractor shall install signs, lights, flares, barricades, and other facilities for the sole convenience and direction of public traffic.

1.6 Public Safety Requirements:

A. Whenever work is being performed adjacent to a lane carrying traffic, the edge of lane or edge of pavement shall be delineated by placing temporary portable delineators adjacent thereto.

B. Whenever the Contractor's operations create a condition hazardous to traffic or to the public, he shall, at his expense and without costs to the Department, furnish, erect, and maintain such fences, barricades, lights, signs, and other devices, and take such other protective measures as are necessary to prevent accidents, damage, or injury to the public. The Contractor shall also furnish such flagmen as are necessary to give adequate warning to traffic or to the public of any dangerous conditions to be encountered. Signs, lights, flags, and other warning and safety devices shall conform to the requirements set forth in the current "MANUAL OF TRAFFIC CONTROLS - Warning Signs, Lights, and Devices for the Use in Performance of Work Upon Highways," issued by the State of California Department of Transportation. **When construction results in only one (1) paved traffic lane being open to traffic, a minimum of two (2) flagmen, with appropriate signs and protective equipment, shall be required to direct traffic through the construction zone. In certain cases, pilot cars and/or radio communication between flagmen may be required.**

C. Should the Contractor appear to be neglectful in taking any protective measures that may be required, the Department may direct his attention to such situation, and the Contractor will provide the necessary warning devices and protective measures needed at no expense to the Department.

D. If the Contractor fails to provide traffic controls and other safety devices that are needed, the Department will provide them and charge any costs against the Contractor's cash deposit. The Contractor may also be billed for any additional costs for repairs or for providing safety devices if costs exceed the amount of the cash deposit. Any such failing to comply with safety requirements will result in removal of the Contractor for future opportunities to bid for at least one full calendar year.

E. Where necessary for public safety and convenience, the Contractor shall, at his expense, provide and maintain suitable drainage of the roadway and erect such temporary structures as are necessary. The suspension of the work from any cause whatsoever shall not relieve the Contractor of his responsibility to provide for the safety and convenience of public traffic and local residents.

F. Emergency repairs: Contractor shall furnish names and telephone numbers of persons to contact in case immediate repairs are needed. If a responsible person is not available at this number, the Department may make immediate repairs and deduct the costs from the cash deposit.

G. Should any traffic striping and/or pavement markings be damaged or removed as a result of the Contractor's operations, they shall be restored or replaced at the Contractor's expense. Traffic stripes and/or pavement markings shall be restored or replaced by

application of thermoplastic material. Under certain situations, traffic stripes and/or pavement markings may be restored or replaced with retro-reflective paint with the prior approval of the Permit Engineer.

H. At the end of the work shift(s), the Contractor will ensure that safety devices adequately identify hazards and control traffic flow, prior to departing the construction area.

1.7 Defective Work or Materials - Inspection oversights committed by Water Department inspectors in no way constitute a de facto approval or acceptance of substandard conditions. The Contractor shall be held liable for any and all substandard material and/or workmanship discovered during any phase or stage of construction up to one (1) year after the project has been accepted and a performance bond has been posted.

1.8 Protection Of Existing Improvements - The Water Department will not be held liable for any damage or disruption of preexisting service appurtenances or infrastructure, regardless of their nature, which may occur during the execution of any construction project being performed for this Department. The responsibility for any and all repairs and/or remuneration associated with damages occurring to either public or private property as a result of the construction of water utilities shall rest solely with the Contractor(s).

1.9 Proximity to Sewers - If the horizontal separation between parallel sewer and water lines is less than ten (10) feet, or if the sewer crosses below the water line with less than one (1) foot of separation, special construction is required by the State Department of Health Services. Special construction will only be done with prior approval from the Water Department. It is the Contractor's responsibility to understand and follow the requirements for sewer and water crossings as mandated by the State Department of Health Services.

1.10 As-Built Drawings - The Contractor shall be required to keep a separate set of construction plans upon which he shall designate as-built conditions using sufficient sketches to properly indicate locations of valves, hydrants, services, and other pertinent items. Contractor shall also provide make and configuration of all valves. Prior to filing of the "Notice of Completion", the Contractor shall certify the as-built information in a letter transferring the as-built documents to the Water Department.

SECTION 2
PAVEMENT REMOVAL

1. GENERAL:

1.1 Scope of Work

A. Furnish all labor, material, equipment and incidentals required to remove the entire section of pavement over the trenches used to install the water mains on the attached plans. The minimum trench width shall be 24 inches unless otherwise stated on plans. Actual trench width will vary with construction method and location.

B. Furnish all labor, material, and equipment necessary to remove and dispose of all excess spoil after the ground asphalt has been returned to the trench for use as a temporary driving surface until main construction is complete.

C. Furnish all labor, material, and equipment necessary to maintain all ground pavement surfaces free from potholes and large loose gravel areas.

D. Furnish all labor, material, and equipment necessary to remove any and all concrete underlayment beneath the pavement as encountered during the pavement removal process.

1.2 Reference Specifications

Except as otherwise specified herein, the current Standard Specifications for Construction, current edition, (a.k.a. "Green Book"), shall apply to materials and workmanship required for the work of this Section.

2. PRODUCTS:

2.1 Materials

A. Use locally available materials and aggregate gradations that exhibit a satisfactory record of previous installations. Any imported material necessary to fill potholes or soft spots in the ground trench shall comply with "Green Book" requirements for Class II base.

3. EXECUTION:

3.1 Layout and Alignment and Commitment

The SBMWD shall provide all construction staking as agreed to in a construction meeting to be held after award.

The Contractor shall review all markings with SBMWD in advance of the start of all grading operations. Any questions regarding trench width, trench location, and alignment shall be discussed and agreed upon prior to the start of the grinding operation.

The Contractor shall provide the SBMWD's Engineering Section with a written statement stating the following:

A. I, the Contractor, have reviewed the field markings with the SBMWD and have agreed on a scope of work.

B. The scope of work is within the bid perimeters which I agreed to when submitting my proposal.

C. I understand that it is my responsibility to maintain the driving surface of the roadway so that it is free from loose rocks, potholes, and dust during the entire construction process.

D. Signed and dated by an authorized agent of Contractor.

3.2 Asphalt Removal

The grinding shall be accomplished by one pass of the **"Bomag MPH 100"** asphalt reclaimer or approved equal. The grinding blade shall be set deep enough to cut through the entire existing pavement section so that no underground portion of asphalt remains within the proposed trench area.

All ground material shall be put back into the ground trench and compacted by wheel rolling and all excess material shall be removed an disposed of by the Contractor at no additional expense to the owner.

At the end of each business day and upon completion of the grinding, all ground areas of asphalt shall have the following characteristics:

A. The uncut pavement surface shall be clear of all loose material.

B. The ground trench shall be approximately level with the surrounding area.

C. The ground material within the ground area shall be free of overly soft or loose material.

3.3 Concrete Removal and Pavement - It is the opinion of the Department that the road bed may contain concrete underlayment. The following process shall be followed whenever concrete underlayment is encountered:

A. When concrete underlayment is encountered during the grinding process, it shall be clearly marked so that the area of concrete removal can be clearly calculated.

B. The Contractor shall meet the SBMWD in the field and review the concrete **prior to removal**.

C. The Contractor shall submit an invoice to the SBMWD clearly identifying the concrete needing removal (from station to station in a specific street), the area of concrete, the unit price for removal submitted on the bid schedule, and the total price for each section of concrete.

D. The SBMWD will then review the invoice and provide the Contractor with written permission to proceed with concrete removal.

E. Payment for concrete removal will be issued upon verification of the completion of work.

F. The unit price provided to the Department on the bid schedule shall include removal, disposal, and overhead profit. The unit price shall apply to all concrete regardless of condition or thickness.

G. Disposal of concrete shall be done in a safe and legal manner.

H. For the purpose of specification, the Contractor shall include 500 s.f. of concrete underlayment in the base bid.

I. The Department will deduct the amount of concrete underlayment less the 1,000 s.f. from the Contract amount.

3.4 Maintenance

Upon completion of the asphalt removal, the Contractor shall maintain all ground pavement surfaces fee from potholes and large loose gravel areas.

SECTION 3
EXCAVATION, TRENCHING AND BACKFILL

1. GENERAL:

All excavation, trenching, backfilling, and pavement refurbishing of existing and proposed streets shall be done in accordance with San Bernardino City Public Works requirements or other agency having jurisdiction, except as noted in these specifications.

In case of conflict in requirements for excavation, trenching, and backfilling between these specifications and any statutes, laws, ordinances, rules, regulations and/or specifications of any political subdivision or agency having jurisdiction, it shall be understood that the more exacting requirements shall govern. In general, these specifications will apply in City of San Bernardino right-of-ways and easements while the aforementioned statutes, laws, ordinances, rules, regulations, and specifications of any political subdivision or agency having jurisdiction will apply within the political boundaries of public right-of-ways to which they apply.

1.1 Excavation and Trenching:

A. All excavation shall be executed to the depths and alignment indicated on the construction drawings regardless of subsurface condition, or special circumstances unless otherwise authorized by the Department. During excavation, material suitable for backfilling shall be piled in an orderly manner, a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. Roads, driveways, and pedestrian walkways shall not be obstructed by spoils or pipe. All excavated materials not required or not suitable for backfill shall be removed and disposed of by the Contractor at no expense to the Water Department.

B. Minimum cover over the pipe shall be thirty (30) inches. Depth of cover shall be measured from the established street grade or the surface of the permanent improvement to the top of the pipe barrel. In the case of lines outside of the existing or proposed street improvements, additional cover may be required, and the depth of cover shall be measured from the average natural ground surface. Any deviation shall be subject to the approval of the Water Department.

C. The width of the trench at the top level of the pipe shall be in accordance with the following table:

PIPE SIZE-INCHES INSIDE DIAMETER	NOMINAL TRENCH WIDTH-INCHES
4	28
6	30
8	32
10	34
12	36
14	38
16	40

The Contractor shall maintain a minimum clearance of eight (8) inches for pipe sizes

through sixteen (16) inches in diameter. The clearance shall be on each side of the pipe between the trench wall and the outside surface of the pipe barrel as measured at the horizontal centerline of the pipeline.

D. Where the bottom of the trench is in rock, large boulders, hard materials or when other utilities are encountered near the pipe alignment, the trench shall be excavated six (6) inches below the bottom of pipe elevation. Where the trench has been excavated below grade for any purpose, the trench shall be refilled to the proper trench grade with selected backfill material and compacted to eighty-five (85) percent of its maximum density as determined by ASTM 1556 and D 1557. (The Water Department may, based on state, county, and/or city compaction requirements, modify this requirement. At no time shall the pipe be installed within a six (6) inch radius of a large rock or hard surface.

E. Excavation for the placement of concrete for structural support and thrust blocks shall be finished by hand in order to ensure a solid undisturbed native surface.

F. The Water Department shall provide, at no expense to the Contractor, limited survey work necessary to accurately construct the proposed water line in accordance with the approved plans.

G. No high or low points in the line shall be permitted except as shown on the plans. No deviation shall be made from the required line or grade except with the written consent of the Water Department. High and low points not shown on the plans shall be fitted with either air release valves, air and vacuum release valves, or blow-off valves as determined by the Water Department's Engineer. All such additional construction shall be performed at no cost to the Water Department.

H. All excavations shall be kept free of water while concrete or pipe is being placed. The Contractor shall furnish, install, and operate all necessary machinery, appliances, and equipment to keep excavations sufficiently free from water from any source during construction of the work to permit proper pipe laying and jointing, and shall dispose of water so as not to cause injury to public or private property, or to cause a hazard or menace to the public.

I. The trench shall be backfilled with sand to provide a minimum of 6" of cover over the newly installed main. All sand shall be jetted in accordance with Green Book Section 306-1.3.3, Titled "Water Densified Backfill". The remainder of the trench may be filled with native material except as required for the construction of the road bed.

J. Drains, sewers, ditches, or other flow routes impacted by construction may be diverted, if necessary, but must be fully restored to their original condition as soon as possible.

K. The use of trench digging machinery will be permitted except where its operations will cause damage to trees, buildings, or existing structures above or below the ground. At such locations, hand excavation shall be employed to avoid such damage. Trees, fences, poles, and other property shall be protected unless their removal is authorized. Any property damaged shall be restored to its original condition by the Contractor to the satisfaction of the Engineer, and at no expense to the Water Department.

L. The Contractor shall maintain property access routes and proper clearance for installation of pipe in easements. Removal and disposal of all trees, stumps, roots, brush, and other objectionable material shall be provided by the Contract at no expense to the Department.

All such site work shall be subject to approval by the Engineer.

1.2 Unstable Soil Conditions

A. It is the opinion of the Department that the Contractor may encounter "unstable soil conditions" during the course of construction. For the purpose of this specification, "unstable soil conditions" shall be defined as follows: **Soil conditions in which the side walls of the trench do not maintain a slope greater than 1 to 3 for a long enough time to place shoring or a trench shield.**

B. There will be no special consideration for stability soils which do meet the above for definition of "unstable soil conditions."

C. When unstable conditions are encountered, the Contractor shall contact the Engineer immediately to observe the condition and determine if it meets the definition. Once the Engineer has determined that an "unstable condition" exists, he shall authorize the Contractor to proceed with construction taking care to provide a wide enough trench to place a trench shield throughout the unstable area.

D. The unit price provided to the Department on the bid Schedule shall be used to pay the additional cost per linear foot encountered during the "unstable soil condition."

E. The Department will add to or deduct from the base quantity of 200 feet of unstable trench condition and adjust the final payment accordingly.

1.3 Backfill:

A. General - Trench backfill shall be executed in such a manner as to provide a minimum of 90% minimum density as determined by ASTM D 1556 and ATM D 1557 unless a higher density is specified on the plans. There shall be no hard surfaces, rocks, or sharp objects within a six (6) inch radius of any pipe. Copies of compaction tests and written results shall be provided to the Water Department's Engineer within three (3) working days of the compaction test.

B. Air Voids - Special attention shall be given to the underside of the pipe during construction to ensure full compaction and to avoid the possibility of air voids in the soil.

C. Compaction Tests - The backfill soil shall be tested for compaction at a minimum rate of one test every 300 feet for every two feet of fill. Additional tests may be required at the discretion of the Water Department's Engineer. If test results indicate a lower than acceptable density, additional compaction will be required and retesting taken under the direction of the Water Department's Engineer. All compaction testing and associated reports shall be completed at no cost to the Water Department.

D. Damage Assessment - Where trench settlement occurs or where it is determined that damage is caused by inadequate compaction in a trench, the Contractor shall reopen the street and recompact the backfill material to an acceptable level. The Contractor shall repair all damage at no cost to the Water Department.

1.4 Non Compactible Soils

A. It is the opinion of the Owner that the Contractor may encounter "non compactible soils"

during the course of construction. The purpose of this specification, "non compactible soils," shall be defined as follows: Soils which are made up primarily of fines that when compacted do not compact down to the required 90% compaction regardless of the energy put into compaction. This condition must be determined by the Engineer after at least 1/2 hour of observation of the compaction and after consulting with the Soils Engineer.

B. When "non compactible soil" is encountered, the Contractor shall notify the Engineer immediately to determine if it meets the definition. Once the Engineer has determined that "non-compactible soil" exists, he shall authorize the Contractor to import Class II Base at the unit price defined in the Contract and bid documents. The soil conditions shall be reevaluated at least two (2) times per day to verify that it continues to meet the definition of "non-compaction soil."

C. For the purpose of this contract, the Contractor is to include 100 cubic yards of imported Class II Base in the lump sum base bid price.

1.5 Pavement Replacement- When it is necessary to break pavement in order to lay the pipelines shown on the construction drawings, the existing pavement shall be cut vertically as nearly as possible to a straight line by a method stated in Section 2, "Pavement Removal," of these specifications.

SECTION 4
PAVEMENT REPAIR AND RESURFACING

1. GENERAL:

1.1 Scope of Work

A. Furnish all labor, materials, equipment, and incidentals required to replace pavement removed over trenches, install approximately one (1) inch final cap ten (10) feet wide. It is the responsibility of the Contractor to field measure the entire project.

B. Furnish all labor, materials, equipment, and incidentals required to repair, replace or restore streets, drain ribbons, driveways, parking areas or sidewalk pavements damaged or disturbed during construction.

C. All work shall be in a manner satisfactory to the Owner.

1.2 Reference Specifications - Except as otherwise specified herein, the current Standard Specifications for Construction, 1994 edition (a.k.a. "Green Book") shall apply to materials and workmanship required for the work of this Section.

2. PRODUCTS:

2.1 Materials

A. Use locally available materials and aggregate gradations that exhibit a satisfactory record of previous installations and as follows:

1. Tack coat: Per "Green Book" Section 302-5.4 either AR/4000 or Grade SS-1h.

2. Asphalt cement: Per "Green Book" Section 203-6 having the following specifications:

- Asphalt shall consist of AR 4000 oil as defined in Section 203-1.
- Aggregate for base pavement shall consist of 3/4" crushed rock as defined in Section 200-1 Table 200-1.2(A).
- Aggregate for final cap shall consist of 3/8" crushed rock as defined in Section 100-1 Table 100-1.2(A).

B. Calcium chloride shall conform to AASHTO M144, Type I or Type II.

3. EXECUTION:

3.1 Preparation for Pavement

A. Removal of Material - All cold mix asphalt and/or excess backfill material shall be removed from the compacted trench to a depth of 7" below finish grade.

B. Damaged Pavement - All damaged pavement adjacent to the edge of trench shall be saw cut and removed in rectangular sections beyond the limits of damage. The Contractor

may, at the time of saw cut, review a specific damaged area in the field with the Engineer or distribution superintendent and receive approval for alternate removal methods. All material below the removed pavement area shall be excavated to a depth of 7" below finish grade.

C. Adding of Subbase Material - The trench shall be backfilled with Class II subbase and compacted to 95% compaction so that once compacted the elevation of the surface of the trench is equal to the bottom of the existing pavement or 3" whichever is greater. After the Class II base has been replaced and compaction is completed, the distance from the surface to the finish grade of the street shall be either 3" or equal to the existing pavement thickness whichever is greater.

3.2 Placement of New Pavement

A. Tack Coat - All surfaces of the existing pavement which may come in contact with the new pavement shall be clean, dry, and tack coated with tack coat as defined in Section 2.1 "Materials."

B. Base Pavement - For trenches parallel to the flow of traffic, asphalt concrete, as defined in Section 2.2 "Materials" shall be placed and compacted flush with existing pavement adjacent to the trench. For trenches crossing the flow of traffic, asphalt concrete, as defined in Section 2.2 "Materials" shall be placed 3/4" below the existing pavement adjacent to the trench.

1. Provide joints between old and new pavements and between successive days works for continuous bond between adjoining work. Clean and dry contact surfaces and apply tack coat.

2. Place mixture at no less than 260°F (127°C). Place each course to required grade cross-section and compacted thickness.

3. All paving shall be compacted with a nine (9) wheel eight (8) ton pneumatic roller or approved equal.

4. All asphalt base pavement shall be placed by a self propelled paving machine. Use of a dump truck ditch gate is not an approved method.

C. Maintenance - The compacted pavement shall be maintained for thirty (30) days with regular traffic over it. At the end of the 30-day period, the finished surface on lateral trench repairs shall not vary more than 1/8" above or 1/2" below the design grade for the base pavement.

D. Pavement Rework - If at the end of the 30-day period, the new pavement surface is outside the parameters stated in the above "Maintenance" paragraph C, the pavement shall be reworked in the following manner:

1. The top 3" of the newly installed asphalt shall be ground and the material removed.

2. The remaining asphalt shall be compacted in place to achieve 95% compaction as measured at a depth of 4-1/2" below finish grade.

3. All the newly ground dry surface shall then be tack coated and re-paved as described above.

4. The re-paved section of trench shall be maintained for another thirty (30) days and then rechecked for conformance.

All pavement rework shall be at no additional cost to the Owner.

E. Final Cap Placement - Final pavement cap shall be hot-mixed asphalt concrete as defined in "Materials" Section 2.2. Area of overlay shall be clean, dry, and uniformly tack coated. Asphalt concrete overlay must extend at least one foot (1') laterally and five feet (5') longitudinally beyond edges of trench excavation and/or pavement damaged by trenching. Asphalt concrete overlay shall be placed parallel to the centerline. The pavement cap shall be placed to provide a dense and smooth riding surface. Compaction of the pavement cap shall be obtained by means of at least one (1) 2-axle, self-propelled steel wheeled five (5) to eight (8) ton roller unless otherwise permitted by the Engineer.

1. Begin rolling when mixture will bear roller weight without displacement. Repair surface defects with hot material as rolling progresses. Cut out and patch defective areas and roll to blend with adjacent satisfactory paving. Continue rolling until maximum density attained and roller marks eliminated.

2. Protect paving from damage and vehicular traffic until mixture has cooled and attained its maximum degree of hardness.

3. For trenches parallel to the flow of traffic, thickness of surface course to be 1" (inch) at center of trench and feather to meet existing paving not less than 1.0' (foot) beyond the edge of the trench. No portion of the cap shall be less than 3/8" (inch) thick over newly cut trench.

4. For trenches crossing the flow of traffic, final cap shall butt up to edge of trench flush with existing pavement.

3.3 Environmental Conditions

A. Dry Subbase - Whenever the subbase becomes dry enough to cause dust problems, spread calcium chloride uniformly over the gravel surface in sufficient quantity to eliminate the dust.

B. Subbase - Shall be free of standing water and shall appear dry prior to asphalt pavement. All pavement surfaces coming in contact with new pavement shall be clean and completely dry prior to tack coating. It is the responsibility of the Contractor to only place asphalt under the above conditions regardless of weather or other circumstances.

C. Cold Temperature - When the air temperature falls below 50°F, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixture. No mixtures shall be placed when the air temperature is below 40°F, nor when the material on which the mixture are to be placed contains frost or has a surface temperature no suitable to the Engineer.

D. Vehicle Traffic After Placement - No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained and the material has

cooled sufficiently to prevent distortion or loss of lines. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.

3.4 Guarantee - All pavement placed shall be maintained by the Contractor for a period of thirty (30) days. During this period, all areas which have settled or are unsatisfactory for traffic shall be refilled and replaced.

SECTION 5
INSTALLATION

1. GENERAL:

All foreign matter and dirt shall be removed from the interior of the pipe prior to its installation. Before being lowered into the trench, the pipe shall be inspected for defects. Any defective pipe, damaged pipe, or pipe that is the wrong class shall be rejected. The entire joint including coupling, machined sections of the pipe, and the rubber gasket or ring shall be thoroughly cleaned at the time the joint is made. The entire procedure and method of installation of the pipe shall be in strict compliance with the pipe manufacturer's direction and recommendations.

All pipe shall be laid according to the size, class, location and grade shown on the plan. Matching surfaces of all pipe ends must be true and brought into firm contact. Rubber ring installation shall be checked with suitable gages to ensure that they are properly located.

When pipe laying is not in progress, the unfinished end of the pipe shall be securely closed with a suitable **water-tight plug** or cover to prevent the entrance of animals or foreign matter into the line.

The Contractor shall take all necessary care and precautions to prevent the pipe from floating due to water entering the trench from any source. The Contractor shall be responsible for damage caused by floating pipe and shall, at his sole expense, restore and replace the pipe to its proper condition, alignment and grade.

Where pipe is laid on a curve or at horizontal or vertical angles in the trench, the maximum deflection at the joint shall not exceed eighty (80) percent of the limitations specified by the pipe manufacturer, and each joint shall be adequately blocked to take the thrust until properly backfilled.

1.1 Hauling and Unloading Pipe - During loading, transportation and unloading, every precaution shall be taken to prevent damage to the pipe, its lining and its coating. No pipe shall be dropped from cars or trucks nor allowed to roll down skids. Each pipe shall rest upon suitable pads, strips or blocks during transportation and while awaiting installation in the field, and shall be securely wedged or tied in place. Padding shall be used on all truck stakes to prevent damage to the coating during transportation and handling.

When it is necessary to move the pipe longitudinally along the trench, it will be done in such a manner as to not damage the pipe or its coating. Pipe shall not be rolled or dragged on the ground. Pipe shall be placed on the ground no longer than one week prior to installation. Any dirt or foreign objects that have accumulated in the pipe shall be removed prior to the pipe being installed.

Where pipe is placed in stock piles, it shall be neatly piled and blocked with strips between tiers and banded with appropriate banding material.

1.2 Protection of Work and Materials - The Contractor shall at all times take care to protect and preserve all materials to be used in the laying of the pipe. The pipe shall be handled in such a manner as to not distort its shape. All pipe and materials which, in the opinion of the Water Department, have been damaged shall be replaced by the Contractor at no expense to the Water Department.

The Contractor shall be responsible for the safe storage of all material furnished by him. All material damaged or broken by the Contractor shall be replaced in exact type and kind by the

Contractor at his expense. All materials received by the Contractor and not used shall be removed by the Contractor at his expense.

1.3 Handling of Pipe and Accessories - Pipe and accessories shall be loaded at the point of delivery, hauled to, and distributed at the site of the project by the Contractor at his expense. They shall at all times be handled with care to avoid damage. Whether moved by hand, skidways or hoists, material shall not be dropped or bumped against pipe or accessories already on the ground or against any other object on the ground.

Pipe shall be handled in such a manner as to avoid damage to machined or special ends. When such damage cannot be repaired to the Water Department's satisfaction, damaged materials shall be replaced by the Contractor at no expense to the Water Department.

The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times.

All pipe, fittings, and accessories shall be carefully lowered into the trench in a safe manner that maintains the integrity of the pipe, using proper tools and equipment. Under no circumstances shall pipe or accessories be dropped, dumped, or rolled into the trench.

1.4 Installation of Ductile Iron Pipe - The ductile iron water mains shall be laid and the work incidental thereto performed in accordance with applicable requirements of A.W.W.A. C600-93 AWWA Standards for the installation of ductile iron water mains and their appurtenances.

All pipe shall be carefully inspected for defects before installation. Such inspection shall include light tapping with a hammer while the pipe is suspended in the air. No pipe or fitting which is cracked or which shows defects shall be used. Any injuries to the protective coating of the pipe or fittings shall be carefully repaired by the Contractor with coal tar pitch varnish. The pipes, valves, and fittings shall be carefully cleaned immediately before installation. During any work stoppage, every open end of a pipe shall be carefully plugged or capped before leaving the work.

1.5 Blow-Off Assembly Installation - Blow-offs shall be installed by the Contractor at the locations shown on the approved plans and positioned to provide complete accessibility, and to minimize the possibility of damage from vehicles or injury to pedestrians. The size and type of blow-off shall correspond to the designation shown on the plans. The entire assembly shall be plumb.

The Contractor shall provide and install all necessary fire hydrant bury extensions to permit installation of the blow-off assembly to proper grade. The Contractor shall be responsible for establishing proper grade per the approved plans.

Upon completion of the water main installation and after the field tests have been performed, each blow-off shall be operated by the Contractor in the presence of the Water Department's representative. Operation shall consist of slowly opening the blow-off assembly and allowing water to flow freely. Upon completion of this sequence, the blow-offs shall be slowly turned off and all protective caps properly placed.

All blow-offs shall be installed with break-away hardware to minimize potential damage to the water main. Guard posts are not permitted for use in protecting water facilities.

1.6 Valve Installation - Valves shall be installed at the locations shown on the plans and shall correspond to the size and types shown on the plans. All valves shall be equipped with a valve box and cap in accordance with standard drawings.

The cutting of pipe for carefully inserting into the bells of valves shall be done neatly and without damage to the pipe, its coating or lining, and in accordance with the manufacturer's instructions.

The Contractor shall not operate gate valves connected to an active water system without a Water Department representative present. During the course of water main installations, all valves shall be left completely open or completely closed unless otherwise authorized by the Water Department. Upon completion of the water mains and all appurtenances, all valves shall be operated through a complete open and closed cycle by the Contractor in the presence of the Water Department representative. After completion of this operational cycle, the Contractor shall leave all valves in an **OPEN** position unless otherwise directed by the Water Department.

1.7 Valve Box and Caps - Valve boxes and caps to be installed in proposed pavement areas of presently unpaved street rights of way shall be installed ten (10) inches below the proposed finished grade of street. The Water Department's Engineer may, at his own discretion, determine a greater depth for valve cap placement. The Contractor shall be responsible for future location of all valve boxes and caps until completion of paving. At least two (2) properly designated witness markers shall be provided and installed by the Contractor to aid future location of valve boxes and caps.

After paving is complete or when valves are installed in existing paved areas, the valve cap shall be positioned with its top one-quarter (1/4) inch below finished grade, and pavement shall be feathered to make a smooth transition to the existing pavement.

1.8 Air and Vacuum Assembly - Air and vacuum assemblies shall be installed at the locations indicated on the plans at sites adjacent to the roadway or on back lot lines as selected by the Water Department. They shall be completely accessible and protected against possible damage from vehicles or equipment. The assemblies shall be installed in accordance with manufacturer's recommendations and in accordance with Standard Drawing Nos. W7.1 and W7.2. Pipe joints shall be assembled in a proper manner to assure that they are free of leaks.

1.9 Concrete Encasements - Concrete encasement shall be installed in a manner to completely surround the pipe barrel at all water course crossings to provide protection from flood flows and eliminate possible water infiltration. The entire procedure shall be in accordance with the pipe manufacturer's recommendations and approved by the Water Department.

1.10 Thrust Blocks - Thrust block locations shall be called out on preliminary water plans (red lines); size will be determined by the Applicant's Engineer. All thrust blocks shall be formed and poured in place against undisturbed native soil. Thrust blocks having concrete in contact with joint assembly hardware will be considered to be unacceptable by the Water Department, and will be removed and replaced by the Contractor at no expense to the Water Department.

1.11 Flanged Fittings and Connections - All flanged valves and fittings shall be properly positioned and aligned in the trench in such a manner as to relieve any stress or strain on the connecting pipe or flanged end being fitted, with the pipe system resting in its final position and all fittings and valves plumb. Welding, if required, shall be done after the pipe is in place, except where otherwise approved by the Water Department.

1.12 Connections With Existing System - All connections to the existing Water Department system will be made under the observation of the Department's representative.

Record drawings used to determine existing pipe size, type, and location shall only be used as a

reference. It will be the responsibility of the Contractor to field verify all such information. Any changes from the plans made due to inaccurate record drawing information will be done at the Contractor's expense.

Test plates or an air gap shall separate the existing water system from new construction until all tests and disinfection have been successfully completed. At no time will a Contractor make such connection or remove test plates without a Water Department representative present.

1.13 Coal Tar Coatings - All buried valves, valve boxes, flanged joints, sleeve-type couplings, and other buried ferrous metal items which are not galvanized or factory coated, shall be thoroughly cleaned and shall be coated with a coal tar coating to a minimum dry film thickness of sixteen (16) mils.

1.14 Sewer Laterals - The Owner does not anticipate that the Contractor will encounter any sewer laterals on this project. However, the Contractor shall include a lump sum unit price for sewer lateral relocation as a part of the Bid documents.

Sewer laterals shall be replaced with like material placed on a fully compacted soil bed with flexible coupling at each connection to the existing lateral.

All soil below and adjacent to sewer laterals shall be compacted to 90%.

SECTION 6
TESTING AND DISINFECTION

1. GENERAL:

After the pipe has been laid and all trenches have been backfilled and compacted, all new pipe shall be given a pressure and leakage test. The test section should be tested with proper test plates rather than against a "closed" valve to avoid possible cross connections. Test plates shall not be removed until the new pipe section has been disinfected and satisfactory bacteriological test results have been reviewed and accepted by the Water Department.

An alternate method to using test plates is to use end caps (with flushing ports) on the end of all newly installed mains. These caps will be installed a maximum of five feet from the proposed point of connection. All pipe and fittings used to make the final connection shall be swabbed with a 1% chlorine solution prior to making such connection. All connections shall be made in the presence of the Water Department representative.

The Water Department's Engineer shall be notified prior to testing, and shall witness the leakage and pressure tests and disinfection process. All written results (pass or failed) shall be provided to the Department's Engineer prior to acceptance and continuation with additional testing.

Before conducting the field tests, the pipe shall be thoroughly flushed, as outlined in the attached flushing procedure, then completely filled with water, and all free air shall be expelled from the line. Any additional taps, valves or blow offs needed to assure all air is expelled shall be provided by the Contractor. Water to be used to fill and flush the pipelines will be paid for by the Contractor. The Contractor shall provide his own pumps and other equipment to properly fill the line with water and produce the required test pressures. The required pressures shall be established and maintained in accordance with AWWA Standard CV600-87 Section 4.1.2 as outlined in the attached procedure.

All thrust blocks forming a permanent part of the line to be tested shall be installed in ample time prior to the test to enable the concrete to properly set (minimum seven (7) days).

THE FOLLOWING PROCEDURES SHALL BE FOLLOWED IN ORDER AND IN THE PRESENCE OF THE WATER DEPARTMENT REPRESENTATIVE:

1.1 Pressure and Leakage Test - After main, hydrant and service lateral installation, backfill and compaction is completed, but prior to connection to the City water system the following pressure and leakage test procedures shall be followed:

A. Test pressure shall be 1.5 times the working pressure at the highest point along the test section. **(1.5 TIMES WORKING PRESSURE FOR THE PIPELINE SHALL BE CONSIDERED TO BE 80 PSI.)**

B. The hydrostatic test shall be of at least 2 hour duration.

C. Test pressure shall not vary by more than ± 10 psi for the duration of the test.

D. All newly laid pipe shall be filled by a water truck or through an approved backflow device.

E. All air shall be expelled completely from the pipe, valves, hydrant and service laterals.

If permanent air release valves are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water.

F. Leakage is defined as the quantity of water that must be supplied into the newly laid pipe to maintain pressure within 10 psi of the specified test pressure. Supply water shall be measured through an approved meter.

G. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}(T)}{133{,}200}$$

Where: L = Allowable leakage (in gallons)
S = Length of pipe tested (in feet)
D = Nominal Diameter of the pipe (in inches)
P = Average test pressure (in psi)
T = Time (in hours)

Should any test of a section of pipeline disclose leakage, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the permitted allowance described above. The pipe shall then be retested by the Contractor at his expense.

1.2 Flushing - Flushing is typically done from an existing system hydrant thru an approved backflow device and into one end of the new system.

A. Flush the line with a quantity of water equal to 3 times the line capacity.

B. Flush all fire hydrants & service laterals.

C. Flushing flow rate shall be sufficient to maintain a minimum pipe line velocity of 3 feet per second through the duration of the flushing process.

D. Minimum diameter of flush line shall be 4 inches on 8 inch and larger mains.

1.3 Chlorination - Chlorination is typically done by mixing an appropriate dosage in a water truck and filling the line from one end through a fire hydrant or 2" tap.

A. Fill line with chlorinated water dosed at not less than 50 mg/l free chlorine. Operate all fire hydrants and service valves to ensure that chlorinated water replaces all air and water in system and contacts all surfaces. Test residual at several locations.

B. Lock all service valves to ensure that no water is taken from the system.

C. The chlorinated water shall be retained in the main for at least 24 hours. At the end of this 24 hour period, the treated water in all portions of the main shall have a residual of not less than 25 mg/l free chlorine.

Note: An alternate method of chlorination using a chlorinator may be acceptable. Submit a detailed explanation of the proposed method including a step-by-step procedure to the Water

Department for review and approval a minimum of one week prior to the proposed chlorination.

1.4 Chlorine Removal - Following successful completion of the chlorine residual test, the main should be flushed as soon as possible (within 24 hours), since prolonged exposure to high concentrations of chlorine might damage the pipe lining or cause corrosion to the pipe itself. The heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is not higher than that generally prevailing in the distribution system.

At that time all hydrants and service laterals shall be thoroughly flushed. The system shall then be shut in for at least 24 hours before bacteriological samples may be taken.

1.5 Disposal of Chlorinated Water - Chlorine is considered, in the State of California, to be a highly hazardous material. As such, it requires special permits for disposal and may not be discharged directly to the ground surface or to storm drains. The Contractor is responsible to dispose of the chlorinated water in a legal manner and must obtain the necessary permits prior to the start of chlorination.

1.6 Bacteriological Tests - After final flushing is complete and before the new water main is connected to the distribution system, samples shall be collected from every 1,200 feet of new main plus one from each end of the line. All samples shall be tested for bacteriological quality in accordance with the Standard Methods for the Examination of Water and Wastewater, and shall show the absence of coliform organisms.

All such testing will be conducted and paid for by the Water Department; however, any retests that may be required will be at the Contractor's expense.

1.7 Permanent Connection to Distribution System - Only after negative bacteriological test results are obtained will permanent connection to the distribution system be allowed. At the discretion of the inspector, the new pipe, fittings, and valve(s) required for the connection may be spray disinfected or swabbed with a minimum 1 percent solution of chlorine just prior to being installed.

1.8 Acceptance - The Water Department will not accept the pipeline until backfill and pavement operations are complete, all gate valve boxes are raised to proper grade, and until the pipelines are proven free from running and other defects to the satisfaction of the Water Department. The acceptance of the dedication of the water system by the Water Department of the completed work as herein specified is subject to the written guarantee of the Contractor that any defects, excessive settlement of backfill and/or leaks in such pipelines arising from defective workmanship or by any negligence of the Contractor which may develop within one (1) year from such acceptance, shall be repaired and made good by said Contractor in accordance with the General Conditions -Part 2, Commencement, Prosecution, and Progress, Section 2-12 Warranty of Works, page 105.

END OF TECHNICAL SPECIFICATIONS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

NEWMARK OU REMEDIAL DESIGN
NEWMARK GROUNDWATER
CONTAMINATION SUPERFUND SITE
NORTH PLANT TRANSMISSION PIPELINE

PREPARED BY
URS CONSULTANTS, INC.
SACRAMENTO, CA.

JULY 1997

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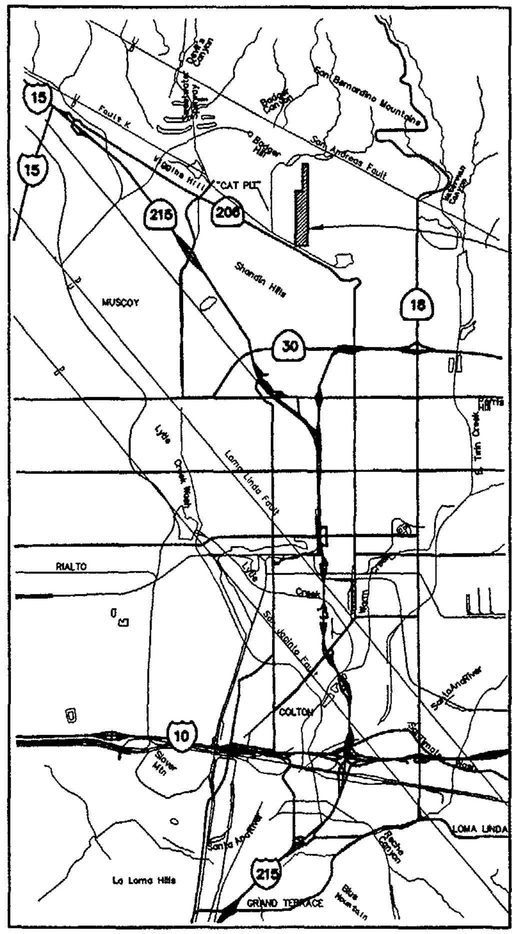


VICINITY MAP

PRIVATE ENGINEER'S NOTES TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN ON THESE DRAWINGS. THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, CONDUIT OR STRUCTURES SHOWN OR NOT SHOWN ON THESE DRAWINGS.

CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIBILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

DIG ALERT

DIAL TOLL FREE
1-800-422-4133

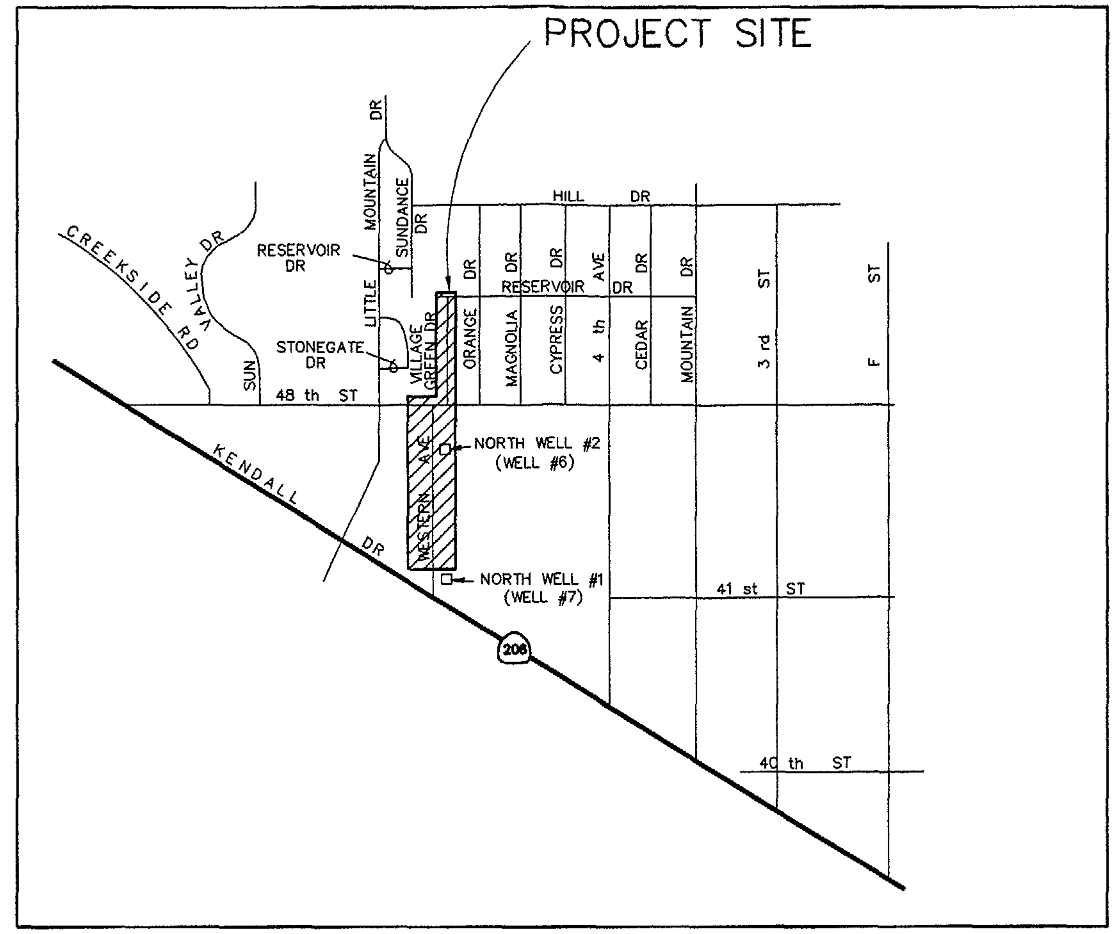
AT LEAST TWO DAYS
BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

GENERAL NOTES

1. BENCHMARK (ELEV. 1409.941 FEET) IS A 2" BRASS DISK STAMPED 'R CLARK WILSON, L.S. 3223' LOCATED 3 FEET EAST OF THE WEST END OF A CONCRETE HEADWALL OF A FLOOD CONTROL BRIDGE OVER THE DEVIL CREEK CHANNEL NORTH OF 42ND STREET ON LITTLE MOUNTAIN DRIVE. CITY OF SAN BERNARDINO DESIGNATION A6-13A, SET 1985.
2. CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR PROTECTION OF EXISTING FACILITIES FROM DAMAGE DUE TO CONTRACTOR'S OPERATIONS.
3. CONTRACTOR AGREES TO ENSURE THAT ALL WORK IS PERFORMED IN A MANNER WHICH MINIMIZES DISTURBANCE TO OWNER'S ONGOING ACTIVITIES AT THE SITE. CONTRACTOR SHALL ENFORCE STRICT DISCIPLINE AND GOOD ORDER AMONG ITS EMPLOYEES AT ALL TIMES. CONTRACTOR SHALL NOT EMPLOY ANY PERSON UNFIT OR UNSKILLED IN ANY PROJECT ASSIGNED TO HIM.
4. OSHA PERMIT IS REQUIRED FOR TRENCHES OVER 5 FT. IN DEPTH, PRIOR TO START OF TRENCH EXCAVATION.
5. ALL WATERLINE CONNECTION POINTS AND CRITICAL UTILITY CROSSINGS POINTS SHALL BE EXPOSED AND ACCURATELY LOCATED AT THE START OF CONSTRUCTION, AND THE SBMWD SHALL BE NOTIFIED OF ANY DISCREPANCIES PRIOR TO THE CONTINUATION OF WORK.
6. THE CONTRACTOR SHALL NOT OPEN MORE TRENCHES THAN CAN BE PROPERLY PROSECUTED IN A DAY'S OPERATION. ANY TRENCH UNAVOIDABLY LEFT OPEN DURING THE HOURS OF DARKNESS OR OVER A WEEKEND SHALL BE FENCED WITH A 6-FOOT CHAIN LINK FENCING AND PROPERLY LIGHTED, OR BRIGE BY A SBMWD APPROVED TRAFFIC PLATE WITH REFERENCE TO THE W.A.T.C.H. MANUAL
7. THE CONTRACTOR SHALL REINSTALL PAVEMENT MARKINGS AND STRIPPING THAT HAVE BEEN DISTURBED BY HIS OPERATIONS.
8. THE CONTRACTOR SHALL PROVIDE SAFE AND CONTINUOUS PASSAGE FOR LOCAL PEDESTRIAN AND VEHICULAR TRAFFIC AT ALL TIMES WITH REFERENCE TO THE W.A.T.C.H. MANUAL.
9. TRAFFIC SIGNALS FUNCTIONS SHALL BE THE RESPONSIBILITY OF THEE CITY OF SAN BERNARDINO, DEPARTMENT OF PUBLIC WORKS; HOWEVER, THE CONTRACTOR IS REQUIRED TO GIVE 48-HOUR NOTICE PRIOR TO ANY CONSTRUCTION THAT MAY DAMAGE OR AFFECT BURIED TRAFFIC DETECTORS.
10. THE CONTRACTOR SHALL SO CONDUCT HIS OPERATIONS AS TO OFFER THE LEAST POSSIBLE OBSTRUCTION AND INCONVENIENCE TO THE PUBLIC, AND HE SHALL HAVE UNDER CONSTRUCTION NO GREATER LENGTH OR AMOUNT OF WORK THAT HE CAN PROSECUTE PROPERLY WITH DUE REGARD TO THE RIGHTS OF THE PUBLIC. CONVENIENT ACCESS TO DRIVEWAYS, HOUSES, AND BUILDINGS ALONG THE LINE OF WORK SHALL BE MAINTAINED. TEMPORARY CROSSINGS SHALL BE PROVIDED AND MAINTAINED IN GOOD CONDITION. NOT MORE THAN ONE CROSSING OR INTERSECTING STREET OR ROAD SHALL BE CLOSED AT ANY ONE TIME WITHOUT THE APPROVAL OF THE WATER DEPARTMENT ENGINEER. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUCH FENCES, BARRIERS, DIRECTIONAL SIGNS, LIGHTS, AND FLAGMEN AS ARE NECESSARY TO GIVE ADEQUATE WARNING TO THE PUBLIC AT ALL TIMES OF ANY DANGEROUS CONDITIONS TO BE ENCOUNTERED AS A RESULT OF THE CONSTRUCTION WORK, AND TO GIVE DIRECTIONS TO THE PUBLIC.
11. ALL REMOVALS IN PAVED AREAS SHALL BE SAW CUT ON A NEAT, STRAIGHT LINE PARALLEL TO THE PIPE LINE. THE CUT EDGE SHALL BE PROTECTED FROM CRUSHING AND ALL BROKEN EDGES SHALL BE RECUT PRIOR TO PAVING OPERATIONS.
12. DUST SHALL BE CONTROLLED AT ALL TIMES BY APPROVED METHODS.
13. PUBLIC STREETS SHALL BE KEPT CLEAN AND FREE FROM DIRT AND/OR DEBRIS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED IN STREET CLEANING NECESSITATED BY HIS OPERATION
14. ALL TRENCH BACKFILLS SHALL BE TESTED AND CERTIFIED BY A SOILS ENGINEER PRIOR TO ACCEPTANCE.
15. THE CONTRACTOR SHALL NOT MAKE ANY CONNECTION TO THE EXISTING SBMWD DISTRIBUTION SYSTEM WITHOUT FIRST GAINING WRITTEN PERMISSION TO DO SO FROM THE WATER DEPARTMENT ENGINEER. IN THE EVENT THAT PERMISSION IS GRANTED, A SBMWD INSPECTOR MUST BE PRESENT ON SITE TO WITNESS SAID CONNECTION(S). TEST PLATES SHALL BE INSTALLED ON THE NEW CONSTRUCTED SIDE OF ALL MAIN CONNECTION POINTS. THE CONTRACTOR MAY USE ALTERNATIVE METHODS.

    ALL FLUSHING, CHLORINATION, AND TESTING SHALL BE PERFORMED EITHER BY (A) WATER TRUCK, OR (B) HYDRANT-TO-HYDRANT CONNECTION THROUGH AN APPROVED BACKFLOW PREVENTION ASSEMBLY.
16. ALL WATER MAINS AND APPURTENANCES SHALL BE PRESSURE TESTED AND DISINFECTED PRIOR TO ACCEPTANCE BY THE SBMWD.
17. ALL TESTING AND DISINFECTION SHALL BE MADE IN THE PRESENCE OF THE INSPECTOR. THE CONTRACTOR SHALL NOTIFY THE ENGINEER NOT LESS THAN TWENTY-FOUR (24) HOURS IN ADVANCE OF THE ACTUAL TIME OF TESTING AND/OR DISINFECTION SO THAT THE WATER DEPARTMENT ENGINEER OR DESIGNEE MAY OBSERVE THE PROCEDURE.
18. IF THE PRESSURE TEST, CHLORINATION OR BACTERIOLGICAL TEST FAIL TO MEET THE REQUIREMENT OF THE SPECIFICATIONS, THE CONTRACTOR SHALL MAKE ALL NECESSARY REPAIRS, REPLACEMENTS OR REPETITION OF PROCEDURES AT HIS OWN EXPENSE.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAVEMENT REPLACEMENT FOR ALL TRENCH CUTS AND DAMAGE TO EXISTING PAVEMENT. CONTRACTOR SHALL BE REQUIRED TO REPLACE THE CUT AND DAMAGED PAVING ACROSS EXISTING PARKING LOT FROM APPROXIMATE STATION 21+04 TO APPROX. STATION 23+56 (SOUTH RIGHT-OF- WAY 42ND STREET) WITH TEMPORARY AC ONLY.



LOCATION MAP

IF SHEET IS LESS THAN 24"X36"
IT IS A REDUCED PRINT
SCALE REDUCED ACCORDINGLY

REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION

04/09/96

DESIGNED BY STL/MA
DRAWN BY JW/NH
CHECKED BY DHD

URS — URS Consultants, Inc. CONSULTING ENGINEERS, SAN BERNARDINO CALIFORNIA

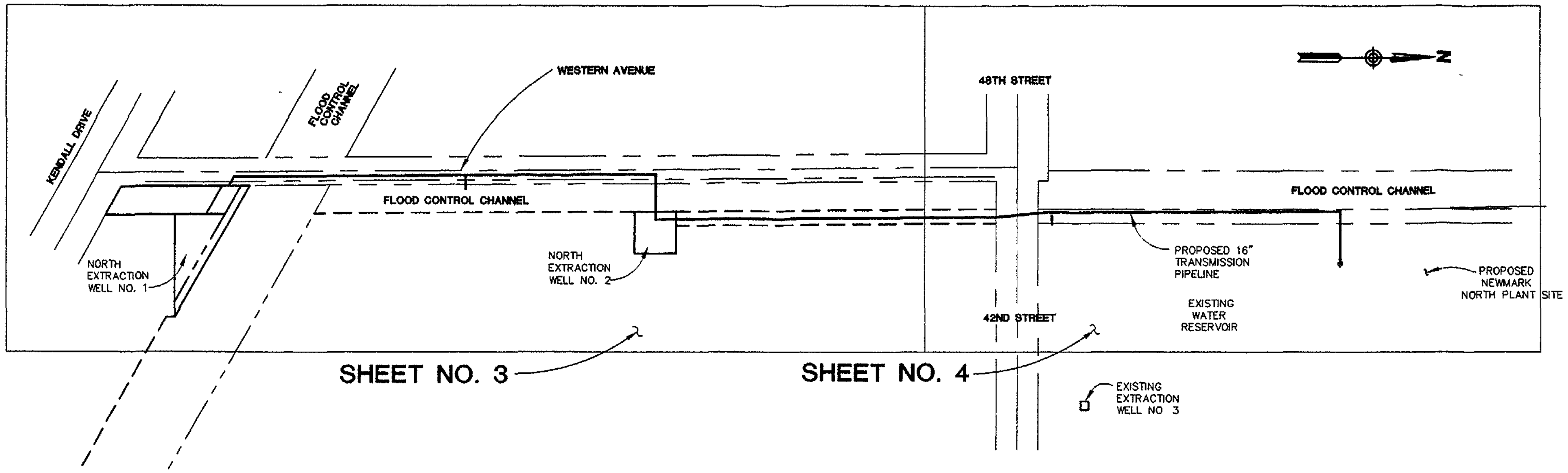
JOB NO 62370 50

REGISTERED PROFESSIONAL ENGINEER, No. 34[?] Dwayne H. Deutscher, EXP 9/30/99, CIVIL, STATE OF CALIFORNIA

NEWMARK OU REMEDIAL DESIGN
NEWMARK GROUNDWATER CONTAMINATION SUPERFUND SITE
NORTH PLANT TRANSMISSION PIPELINE

LOCATION MAPS & GENERAL NOTES

Scale	Date	Dwg. No
AS SHOWN	JULY 31, 1997	01



LEGEND

— — — —	EXISTING BURIED PIPELINE
——— – ———	CENTERLINE
—— – – ——	RIGHT-OF-WAY LINE
━━━━	NEW PIPELINE
— —o— —	MANHOLE
⧓	GATE VALVE
◂	REDUCER
⊖	BUTTERFLY VALVE
—●	C A.V
—➔●	BLOWOFF VALVE

ABBREVIATIONS

BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BO	BLOW OFF
CAV	COMBINATION AIR VALVE
CL	CEMENT LINED
℄	CENTERLINE
D	DRAIN
DIP	DUCTILE IRON PIPE
E	ELECTRIC
FCA	FLANGED COUPLING ADAPTOR
FLG	FLANGED
G	GAS
GB	GRADE BREAK
INV	INVERT ELEVATION
LF	LINEAL FEET
LT	LEFT
MJ	MECHANICAL JOINT
PRV	PRESSURE REDUCING VALVE
RCP	REINFORCED CONCRETE PIPE
RT	RIGHT
RW	RIGHT-OF-WAY
S	SLOPE
SBCFCD	SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT
SS	SANITARY SEWER
STA	STATION
W	WATER
W/	WITH
WP	WRAPPED

SHEET INDEX

TITLE SHEET
1. LOCATION MAPS & GENERAL NOTES
2. INDEX MAP
3. PLAN & PROFILE
4. PLAN & PROFILE
5. MISC. DETAIL
6. MISC. DETAIL
7. 4" FORCE MAIN WASTE LINE
8. DETAILS

REV	DATE	DESCRIPTION	REV	DATE	DESCRIPTION

DESIGNED BY STL/MA
DRAWN BY JW/NH
CHECKED BY DHD

URS — URS Consultants, Inc
CONSULTING ENGINEERS
SAN BERNARDINO CALIFORNIA

JOB NO 62370 50

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA — CIVIL

NEWMARK OU REMEDIAL DESIGN
NEWMARK GROUNDWATER
CONTAMINATION SUPERFUND SITE
NORTH PLANT TRANSMISSION PIPELINE

INDEX MAP

Scale	Date.	Dwg No
NONE	JULY 31, 1997	02

04/09/96